

Appln. Serial No. 10/056,880  
Amendment Dated December 6, 2007  
Reply to Office Action Mailed September 11, 2007

### REMARKS

In the Office Action dated September 11, 2007, claims 1-10, 14, 18-25, 27, 28, 30, and 32 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,138,111 (Krishna) in view of U.S. Patent No. 6,338,056 (Dessloch); and claims 11, 12, 16, 17, and 28 were rejected under 35 U.S.C. § 103(a) as unpatentable over Krishna in view of Dessloch, and U.S. Patent No. 6,026,390 (Ross).

Applicant acknowledges the indication that claims 26, 29, and 31 would be allowable if rewritten in independent form. Claims 26 and 31 have been amended from dependent form to independent form, with their scope **unchanged** to place these claims in condition for allowance as indicated by the Office Action. The dependencies of claims 3, 8, and 9 have been changed to depend from allowable claim 26.

Claim 1 has been cancelled, without prejudice, to render the rejection of the claim moot.

Claim 27 has been amended from dependent form to independent form, with the scope of claim 27 remaining **unchanged**. Claim 27 recites receiving a join query containing at least one function selected from the group consisting of a selection predicate applied on a complex attribute, a projection applied on a complex attribute, and a user-defined data type method, where the join query specifies application of the function on the **first table**. Claim 27 further recites determining a cost associated with applying the function on the first table and a cost associated with applying the function on a second table, where the second table contains a **join result** of a join of the first table and another table. Moreover, claim 27 recites selecting a join path in which the function is applied on the **second table** that contains the **join result of the join of the first table and the another table**.

The concept of selecting application of a function on a table that contains a join result, rather than on a first table as specified by the join query, is clearly non-existent in Krishna and Dessloch. With respect to claim 27, the Office Action cited column 1, lines 43-57, and column 3, lines 30-41, of Krishna as disclosing the additional feature of claim 27. The cited column 1 passage of Krishna refers to a join query that contains a join predicate that can be used to select records from two tables. The cited column 3 passage of Krishna refers to an example join query in which tables R, S, and T are joined, and where there are two possible join orders: (1) join tables R and S, and then join the result with table T, and (2) join tables S and T, and then join the

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result with table R. Changing the orders of joining tables R, S, and T, as taught by Krishna, is completely different from the subject matter of claim 27, which teaches that, despite the query specifying application of the function on the **first** table, the join path selected is one in which the function is applied on the **second** table, where the second table contains a **join result of a join of the first table and another table**.

Therefore, even if Krishna and Dessloch can be hypothetically combined, their combination would achieve subject matter that is significantly different from the subject matter of claim 27. Therefore, a *prima facie* case of obviousness has not been established with respect to claim 27 for at least this reason.

Moreover, there simply existed no reason to combine Krishna and Dessloch in the manner proposed by the Office Action. Krishna deals with calculating an optimal *order* in which to join tables in a multiple join query. Krishna, 3:26-27. In other words, Krishna is concerned with selecting an order of joins of multiple tables to achieve minimum cost. Krishna has nothing to do with selecting a join path based on cost associated with applying a function (that is one of a selection predicate applied on a complex attribute, a projection applied on a complex attribute, and a user-defined data type method) on the first and second tables. On the other hand, Dessloch describes a mechanism that determines whether an external index 114 is to be used or not to enhance database searching. Dessloch thus provides no hint of selecting a join path based on relative cost of applying the recited function on first and second tables. Therefore, no reason existed in either of the teachings of Krishna or Dessloch that would have prompted a person of ordinary skill to modify Krishna in the manner proposed by the Office Action. *See KSR International Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741, 82 U.S.P.Q.2d 1385 (2007). The *prima facie* case of obviousness is defective for this further reason.

Dependent claims 2 and 10 have been amended to depend from allowable base claim 27.

Claim 21 has been amended from dependent form to independent form, with the scope of claim 21 remaining **unchanged**. Claim 21 is allowable for similar reasons as claim 27.

It is also respectfully submitted that independent claim 32 is non-obvious over Krishna and Dessloch. The Office Action conceded that Krishna fails to disclose "selecting a join path for the join query in response to determining whether the at least one of the selection predicate and projection is applied on a conflicts attribute," and where "a first join path is selected in

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which the at least one of the selection predicate and projection is applied on a join table in response to determining that the at least one of the selection predicate and projection is applied on a complex attribute, the join table containing a join result of the first and second tables.” 9/11/2007 Office Action at 15-16. Rather, the Office Action cited Dessloch as disclosing the feature missing from Krishna.

Note, however, that claim 32 is directed to selection of a first or second join path depending on whether a selection predicate or projection is applied on a complex or non-complex attribute. This selectivity between different join paths based on whether or not the selection predicate or the projection is applied on a complex or non-complex attribute is a concept that exists nowhere in Krishna and Dessloch.

Krishna is concerned with selecting an order of joins of multiple tables to achieve a minimum cost in the context of predicates applied on non-complex attributes. However, Krishna provides no hint whatsoever that a different join path would be selected in response to the selection predicate or projection being applied on a complex attribute. Although Dessloch discloses relational database systems that can be used with images, video, audio, and non-traditional data types, there is absolutely no hint in Dessloch of selecting different join paths based on whether or not a selection predicate or projection is applied to a complex or non-complex attribute.

Since the hypothetical combination of Krishna and Dessloch would have resulted in subject matter significantly different from the subject matter of claim 32, it is respectfully submitted that a *prima facie* case of obviousness has not been established with respect to claim 32. Moreover, as discussed above in connection with claim 27, no reason existed that would have prompted a person of ordinary skill in the art to combine the teachings of Krishna and Dessloch.

Independent claim 11 was rejected as being obvious over Krishna, Dessloch, and Ross. The Office Action conceded that the purported combination of Krishna and Dessloch fails to disclose the following combination of elements: “the join query specifying a join of a first table and a second table to produce a join table,” and “wherein determining the join path comprises selecting the join path in which the function is applied on the join table rather than the first table or second table to reduce cost.” 9/11/2007 Office Action at 19. Instead, the Office Action relied

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upon Ross, and more specifically, to column 12, lines 30-55, of Ross. The cited passage of Ross refers to combining materialization and query costs, and then minimizing costs for each updated relation. The cited passage also refers to determining whether materializing certain views would be more efficient than others. As noted by Ross, time costs of the maintenance can be reduced by materializing and maintaining additional views. Ross, 3:12-15.

However, the determination of what views to materialize to reduce costs, as taught by Ross, has nothing to do with the claimed subject matter, namely selecting a join path in which a function is applied on a join table rather than the first table or second table in the context of a join query specifying a join of the first table and the second table to produce the join table.

Therefore, even if Krishna, Dessloch, and Ross were to be hypothetically combined, their combination would lead to subject matter that is significantly different than the claimed subject matter.


Moreover, since no reason existed that would have prompted a person of ordinary skill in the art to combine the teachings of Krishna and Dessloch, it is respectfully submitted that a person of ordinary skill in the art would also not have been prompted to combine the teachings of Krishna, Dessloch, and Ross to achieve the claimed invention.

Dependent claims are allowable for at least the same reasons as corresponding independent claims.

Allowance of all claims is respectfully requested. The Commissioner is authorized to charge any additional fees and/or credit any overpayment to Deposit Account No. 50-4370 (9786).

Respectfully submitted,

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